

REMARKS

Reconsideration and allowance of the present application based on the following remarks are respectfully requested.

Entry of the above amendments to the specification and claims is respectfully requested. Upon entry of the amended and new claims, claims 1-20 will be pending and offered for further examination and reconsideration.

New Claim 15 recites that the organosilane is mixed in the rubber composition in free form or on a carrier which may be a silicic acid, natural or synthetic silicate or aluminum oxide. Support for this claim may be found, for example, on page 4, first full paragraph.

The amendments to the specification merely correct obvious typographical errors and omissions without changing the meaning and scope of the invention and without introducing new matter into the application. The amendment to the last paragraph of page 2 merely corrects the name of the silane in accordance with the remainder of the disclosure, e.g., page 3, lines 15-16. The correction in Table 1, merely adds the particular grade, "GR" for the silane ULTRASIL VN3.

The amendments to the claims overcome the objections in paragraphs 1-5 and the rejections in paragraphs 6-9, without introducing new matter.

Regarding the objections in ¶1 and ¶2, the term "alkylidene" is corrected in amended claims 1 and 6 as "linear or branched (C₁-C₄) divalent hydrocarbon group" in accord with the specification on page 2, line 26, the examples and claims 7 and 8. Corresponding corrections are made in the specification.

Claim 7 is amended to complete the first compound consistent with claim 8 and the specification and examples.

Claim 9 is amended to more positively recite the manipulative step.

Claims 11 and 12 are amended to be directed to the pneumatic tire and tire cord, respectively.

Accordingly, removal of all the objections is requested.

Claim 8 is amended to clarify that the alkylsilane is other than one of the organosilane-polysulfanes.

Claims 12 and 13 are amended to recite that a pneumatic tire or a tire tread comprises the molding according to claim 11.

Accordingly, the rejections under 35 USC 112, second paragraph in ¶7 and ¶8, are avoided.

As noted above, new claims 15-20 are added to the application. Claim 15 further introduces the feature that the organosilane is mixed with the rubber in unsupported form or supported on a carrier selected from the group consisting of silicic acids, natural silicates, synthetic silicates and aluminum oxide. Claims 16-20 are also supported throughout the specification, for example, mention may be made of page 3, lines 15-16, page 4, lines 16-22; page 6, lines 27-29.

Therefore, none of the amended or added claims introduce new matter.

Reconsideration of the rejection of claims 1-8 as fully anticipated by Wolff et al, U.S. 5,159,009, is respectfully requested for at least the following reasons.

The disclosure of Wolff et al is that carbon blacks are chemically modified with one or more of the organosilanes identified by formulas (I), (II), and (III). These broad and generic disclosures do not literally describe organosilanes of formula



wherein R¹, R² and R³ independently of one another are H, (C₁-C₄)alkyl, (C₁-C₄)alkoxy or halogen and the number of alkyl groups is ≥1; R⁴ is a linear or branched(C₁-C₁₈)alkylidene group; and Z = H, halogen, SCN, SH or S_x-R⁴-SiR¹R²R³, where x is 2 to 10.

There are no guidelines or directions leading the practitioner to compounds of formula (I) as set forth in the rejected claims.

Wolff et al provide no exemplification of specific compounds or preferences for the selection of the various parameters R, R1, B, Ar, Alk, Alkyl, Alkenyl, or q, n, q or x. The only guidelines in the disclosure are the specifically exemplified compounds Si 69 (bis(3-triethoxysilylpropyl)-tetrasulfane), Si 264 (3-thiocyanatopropyl-triethoxysilane), Si 230 (3-chloropropyl-triethoxysilane) and Si 221 (3-butenyltriethoxysilane) (see the table for “Initial and raw materials used” in column 4).

As is readily apparent from the underlined portions of these four compounds, all of the exemplified compounds are trialkoxy compounds, precisely the subject matter which the present invention intends to avoid.

Therefore, one of ordinary skill in the art would not be able to find the subject matter as claimed within the broad disclosure of Wolff et al. Accordingly, Claims 1-8 are not anticipated by Wolff et al.

Furthermore, dependent Claims 2-8 are additionally distinguishable over the disclosure of Wolff et al.

Claim 2: There is no disclosure of dialkylmonoalkoxysilyl functional groups in the disclosure of Wolff et al. Therefore, claim 2 is not anticipated for this additional reason.

Claim 4: There is no disclosure of a mixture of organosilane-polysulfane and organoalkylsilane. Therefore, claim 4 is not anticipated by Wolff et al for this additional reason.

Claim 5: There is no disclosure of compounds of formulas (I), (II) or (III) wherein R¹ is ethoxy or methoxy; R² and R³ are methyl; R⁴ is propylene or isobutylene and Z is S_x-R⁴-SiR¹R²R³. Therefore, claim 5 is not anticipated for this additional reason.

Claim 6: Similarly, there is no disclosure of a compound in which R¹ = ethoxy or methoxy; R² = R³ = methyl and R⁴ = (C₁-C₁₈) divalent hydrocarbon. Therefore, claim 6 is not anticipated by the disclosure of Wolff et al for this additional reason.

Claims 7 and 8: The disclosure of Wolff et al does not describe rubber mixtures which include silicic acid as filler. Claims 7 and 8, therefore are not anticipated by Wolff et al for this additional reason. Additionally, as noted above, Wolff et al does not describe the organosilane-polysulfanes or mixtures with alkylsilanes which are recited in claims 7 and/or 8.

For all of the above reasons, withdrawal of the rejection of claims 1-8 as anticipated by Wolff et al, U.S. 5,159,009, is requested.

This subject matters of new claims 15-20 are not described in the Wolff et al patent. According to Wolff et al, carbon blacks are chemically modified with one or more organosilicon compounds of Formulas (I), (II) or (III). There is no disclosure in Wolff et al of incorporating free organosilicon compounds of Formulas (I), (II), or (III) or such organosilicon compound supported on silicic acid, natural or synthetic silicate or aluminum oxide, in a rubber mixture. As such, there can be no anticipation of these new claims.

Reconsideration and withdrawal of the rejection of claims 9-14, under 35 USC 103(a) as unpatentable over Wolff et al in view of Takeichi, U.S. 6,008,295, is respectfully requested.

As described above, Wolff et al does not disclose rubber mixtures according to claims 1-8. Therefore, since claims 9-14 depend, directly or indirectly on claim 1, the subject matters of claims 9-14 would not have been obvious over the combined disclosures, even assuming proper motivation for combining these references. For sake of completeness, it is also noted that Takeichi does not obviate the deficiencies of Wolff et al with regard to the missing features of claims 1-8, including reducing the number of alkoxy groups to minimize the release of alcohol during preparation of the rubber mixture.

In view of the foregoing, the claims are now believed to be in form for allowance, and such action is hereby solicited. If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

Attached is a marked-up version of the changes made to the specification and claims by the current amendment. The attached Appendix is captioned "Version with markings to show changes made".

All objections and rejections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,

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Enclosure: Appendix

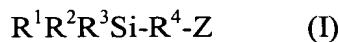
APPENDIX
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The specification is changed as follows:

Page 2, the whole paragraph starting in line 19 (Beginning, "The invention provides ..." is replaced with the following new paragraph:

--The invention provides rubber mixtures which are characterized in that they contain organosilanes of the general structure



wherein R^1 , R^2 and R^3 independently of one another are H, (C_1-C_4)alkyl, (C_1-C_4)alkoxy or halogen and the number of alkyl groups is ≥ 1 ; R^4 is a linear or branched (C_1-C_{18}) divalent hydrocarbon [alkylidene] group; and Z = H, halogen, SCN, SH or $S_x - R^4 - SiR^1R^2R^3$, where x is 2 to 10.

Page 2, the whole paragraph starting in line 30 (Beginning, "Preferred organosilanes of the type described ..." is replaced with the following new paragraph:

--Preferred organosilanes of the type described above are those with dialkylmonoalkoxysilyl functional groups in place of the trialkoxysilyl functional groups conventionally used. Particularly preferred silanes are the [bis(3-{dimethylethoxysilyl}polysulfanes)] bis(3-{dimethylethoxysilylpropyl}polysulfanes) according to the invention.--

Page 3, the whole paragraph beginning on line 1 is replaced with the following new paragraph:

--Rubber mixtures according to the invention may include organosilanepolysulfane and organoalkylsilane compounds. The organosilane polysulfane may be a silane in which R^1 = ethoxy or methoxy, $R^2 = R^3 =$ methyl, $R^4 =$ propylene or isobutylene [propylidene or isobutylidene] and $Z = S_x - R^4 - SiR^1R^2R^3$, where x has a statistical mean value of 2 to 4. In

another embodiment, the organosilane may be a silane in which R¹ = ethoxy or methoxy, R² = R³ = methyl and R⁴ = (C₁-C₁₈) divalent hydrocarbon [alkylidene] group.--

Table 1 on page 8 is changed in the fifth row by adding "GR" following Ultrasil VN3, as follows:

Table 1

Substance	Amount [phr]
1st stage	
Buna VSL 5025-1	96.0
Buna CB 24	30.0
Ultrasil VN3 <u>GR</u>	80.0
ZnO	3.0
Stearic acid	2.0
Naftolen ZD	10.0
Vulkanox 4020	1.5
Protector G35P	1.0
Silane	acc. to Ex. 1, 2
2nd stage	
Batch stage 1	
3rd stage	
Batch stage 2	
Perkacit TBZTD	0.2
Vulkacit D	2.0
Vulkacit CZ	1.5
Sulfur	1.5

The paragraph beginning on line 4, of page 9, is changed by adding GR following ULTRASIL VN3, in the first line, as follows:

--The silicic acid ULTRASIL VN3 GR from Degussa AG has a BET surface area of 175 m²/g. TESPD (bis(3-[triethoxysilyl]propyl)disulfane) of Comparative Example 1 is prepared according to patent D 195 414 04. The silane of Example 2, bis(3-[dimethylethoxysilyl]propyl)disulfane, is prepared according to the state of the art by the hydrosilylation of chlorodimethylsilane with allyl chloride, followed by ethanolysis and sulfurization analogously to the process indicated in patent D 197 342 95 A1.

IN THE CLAIMS:

7. (Amended) Rubber mixtures according to Claim 1, comprising a synthetic rubber, a silicic acid as filler and an organosilanopolysulfane selected from the group consisting of [bis(3-{dimethylethoxysilyl}propyl)] bis(3-{dimethylethoxysilyl}propyltetrasulfane and bis(3-{dimethylethoxysilyl}propyl)-disulfane.

8. (Amended) Rubber mixtures according to Claim 1, comprising a synthetic rubber, a silicic acid as filler and an organosilanopolysulfane selected from the group consisting of bis(3-{dimethylethoxysilyl}propyltetrasulfane and bis(3-{dimethylethoxysilyl}propyl)-disulfane, and an alkylsilane other than said organosilanopolysulfane.

9. (Amended) Process for the preparation of rubber mixture [according to Claim 1], comprising at least one filler in addition to the rubber, [wherein] said process [comprising] comprising adding an organosilanopolysulfane according to Claim 1 in said rubber mixture.

10. (Amended) Process for the preparation of rubber mixtures which contain at least one filler in addition to the rubber, comprising adding an organosilanopolysulfane according to Claim 1 and an organoalkylsilane [according to Claim 1].

12. (Amended) A [molding according to Claim 11, comprising a] pneumatic tire comprising the molding according to claim 11.

13. (Amended) A [molding according to Claim 11, comprising a] tire tread comprising the molding according to claim 11.

End of Appendix